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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/912,207	07/24/2001	Haydn James Gregory	NSC1-F4020	8140

7590 10/06/2003

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EXAMINER

CHUNG, DAVID Y

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicant's Name

09/912,207

Applicant(s)

GREGORY, HAYDN JAMES

Examiner

David Y. Chung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 June 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 15-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**1. Claim 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Parks (U.S. 5,355,251) in further view of Kume et al. (U.S. 6,115,098).**

Parks discloses an active matrix substrate having sets of display pixels that are diagonally adjacent to each other. Note the display pixels 52 in figure 5. The space between two diagonally adjacent display pixels includes a first edge defined by the first pixel and a second edge defined by the second pixel, with the two edges being parallel.

Parks does not disclose dielectric spacers in the gaps between the diagonally adjacent display pixels. Kume et al. discloses pillar-like spacers that are arranged at the corners of each pixel region. Kume et al. teaches that by arranging the spacers at the corners of each pixel region, the spacers do not obstruct the injection of the liquid crystal material into the cell and the injection rate does not have to be reduced. Thus, the chromatographic phenomenon is less likely to occur, thereby reducing the display non-uniformity and improving the display quality. See column 14, lines 19-38. It would

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have been obvious to one of ordinary skill in the art at the time of invention to provide spacers in the spaces between diagonally adjacent pixel electrodes in the device of Parks in order to reduce display non-uniformity due to the chromatographic phenomenon and thereby improve the display quality.

**2. Claims 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Parks (U.S. 5,355,251) in further view of Kume et al. (U.S. 6,115,098) and Crawford et al. (U.S. 5,978,063).**

Parks and Kume et al. do not disclose dielectric spacers comprising silicon oxide, silicon nitride, or organic polymers. Crawford et al. discloses forming spacers using negative UV curable polyimide or alternatively from a deposited dielectric such as CVD oxide or nitride. Crawford teaches that by forming spacers from these materials, the spacer distribution and count can be precisely controlled with known photolithography techniques. See column 3, lines 45-60. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to form dielectric spacers from silicon oxide, silicon nitride, or negative UV curable polyimide in order to precisely control the distribution and count of the spacers with known photolithography techniques.

### ***Response to Arguments***


Applicant's arguments with respect to claims 15-18 have been considered but are moot in view of the new ground(s) of rejection.

**Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Chung whose telephone number is (703) 306-0155. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:00 pm.

  
**ROBERT H. KIM**  
**SUPERVISORY PATENT EXAMINER**  
TECHNICAL CENTER 2800

David Chung  
GAU 2871  
09/19/03